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SHELTER APPARATUS

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(71) Applicant(s)
SUMMERCRAFT BLIND AND AWNING COMPANY PTY. LTD.

(72) Inventor(s)
IAN MCKINNON

(74) Attorney or Agent
PIZZEY & COMPANY , GPO Box 1374, BRISBANE QLD 4001

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AU 598998 21817/88 E04H 15/50 15/48 15/18
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(57) Claim

1. A folding shelter frame assembly of the type including peripheral supporting posts interconnected by scissor linkage assemblies forming respective upper and lower pivot connections to said peripheral posts, the respective upper pivot connections being fixed to the upper ends of the respective posts and the lower pivot connections being slidably fixed to the respective posts, whereby the frame assembly may be moved from a folded configuration with the posts adjacent to one another to an extended configuration with the posts spaced apart, wherein said posts are provided with fixed abutment means adapted to limit upwards travel of the lower pivot connections and maintain the lower pivot connections operatively spaced below said upper pivot connections when the frame assembly is in its extended configuration.

624796

COMMONWEALTH OF AUSTRALIA
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SUMMERCRAFT BLIND & AWNING COMPANY PTY. LTD.

(Patent Application Number PI 5435)

COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:-

"SHELTER APPARATUS"

The following statement is a full description of this invention, including the best method of performing it known to us:-

"SHELTER APPARATUS"

This invention relates to shelter apparatus.

This invention has particular but not exclusive application to collapsible shelters for weather protection, and for illustrative purposes reference will be made to such application. However, it is to be understood that this invention could be used in other applications, such as temporary homes and garages.

There is a frequent need for the use of portable shelters with membrane covers, particularly for recreational use. In many cases, tents of conventional design are used, but these are inconvenient to erect, and on surfaces such as beach sand which do not provide a good grip for tent pegs, they are quite difficult to erect.

Shelters which have rigid frames often require the assembly of numerous components to form the frames, and the transport of and erection of these components is often inconvenient and time consuming. Shelters of this type often leave the roof unsupported over relatively large spans, and require the use of support posts within the shelter.

The present invention aims to alleviate the above disadvantages and to provide shelter apparatus which will be reliable and efficient in use. Other objects and advantages of this invention will hereinafter become apparent.

With the foregoing and other objects in view, this invention in one aspect resides broadly in a folding shelter frame assembly of the type including peripheral supporting

posts interconnected by scissor linkage assemblies forming respective upper and lower pivot connections to said peripheral posts, the respective upper pivot connections being fixed to the upper ends of the respective posts and the lower pivot connections being slidably fixed to the respective posts, whereby the frame assembly may be moved from a folded configuration with the posts adjacent to one another to an extended configuration with the posts spaced apart, wherein said posts are provided with fixed abutment means adapted to limit upwards travel of the lower pivot connections and maintain the lower pivot connections operatively spaced below said upper pivot connections when the frame assembly is in its extended configuration.

Preferably, a flexible membrane cover is attached to the frame, and the cover may be stored in a folded position when the frame is in the stowed position and extends to form a shelter when the frame is in the extended position. Of course, the cover may be formed as a separate article if desired, the cover being fitted over the frame or attached thereto after erection of the frame. Covers may be formed of waterproof material or plastics sheet, although of course if desired covers may be formed of other materials such as shadecloth.

The linkages may include telescopic slides whereby the posts may be moved together or apart. Preferably, however, the linkages are formed with scissor link pairs, including a first link attached at a post end thereof by a fixed pivot

attached to the upper portion of a post and a second link of the pair being attached at a post end thereof by a sliding pivot slidably attached to the post. The other ends of the scissor links may be attached to other posts, or, if desired, they may be attached at scissor pivots to respective free ends of corresponding links disposed in a common plane therewith such that bridging linkages may be formed capable of spanning, in the extended position, distances between adjacent posts approaching twice the length of the links.

The sliding pivot may be retained in its operative position by locking means such as a spring clip. Preferably, however, the post includes an upper limit stop against which the sliding pivot is urged by the action of gravitational forces on the frame assembly in a supporting attitude.

Other linkages may be attached to linkage nodes such that grids of linkages may be formed. Grids may be formed from scissor links of symmetrical disposition, whereby the linkages may be horizontal when the posts are vertical in the extended position. If desired, the frame may include asymmetric linkages whereby linkages may adopt an inclined attitude when extended.

Bridging linkages may be utilised as peripheral linkages to form the periphery of the frame assembly, each peripheral linkage extending between adjacent posts disposed vertically about the periphery of the frame assembly. Bridging linkages may also be utilised as cross linkages having the free ends of respective links forming the cross linkages attached to

the scissor pivots of selected pairs of peripheral linkages.

In a preferred embodiment, four posts are provided, and adjacent pairs thereof are joined by four peripheral linkages. Cross linkages are attached between opposed pairs of peripheral linkages, and the intersecting cross linkages are joined at their respective scissor pivots to form respective upper and lower pivot assemblies.

The upper central pivot assembly may be attached to a central post and the lower central pivot assembly may be detachably attachable to the central post by pole attachment means. If desired, the central post may extend upwardly beyond the upper central pivot assembly for supporting the flexible membrane cover, whereby the latter may slope toward its periphery to shed rainwater. The pole attachment means may include a spigot formed in the upper portion of said central pivot assembly and engageable with the lower end portion of the central pole with the shelter apparatus in the extended position, such that the central pole may be supported by the cross linkages, whereby the region beneath the short post may be unobstructed.

Posts may be fixed in length, but may if desired include telescopic sections whereby the posts may be lengthened in the operative position to increase the height of the shelter. Further covers may be added to the frame in the form of sides whereby an enclosure may be formed.

Holding means may be attached to the frame, whereby the shelter may be stabilised against extraneous forces such as

wind forces. The holding means may be in the form of anchors which may be engaged with the ground, or if desired the holding means may be in the form of weights attached to the posts. Weights may be formed such that they are detachable, or may be in the form of hollow chambers which may be filled with water or soil.

In a further aspect, this invention resides broadly in shelter apparatus including a frame assembly having a plurality of posts and linkages which are pivotally interconnected to form a grid of linkages having cover support means disposed remote from said posts.

In another aspect, this invention resides in a method of forming a shelter, including:-

providing a frame assembly having a plurality of posts interconnected by linkages which are movable between a stowed position in which said posts are held adjacent one another, and an extended position in which said posts are disposed in a supporting attitude remote one another;

providing a flexible membrane cover attached to said frame assembly; and

extending said frame assembly into said extended position such that said membrane cover is extended over said frame assembly to form a shelter.

In order that this invention may be more easily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention, wherein:-

FIG. 1 is a pictorial view of a frame in the extended position;

FIG. 2 is a pictorial view of a shelter in the folded position;

FIG. 3 is a pictorial view of the shelter in a partially-folded position, and

FIG. 4 is a pictorial view of the shelter in an operative position.

The frame 10 shown in FIG. 1 includes posts 11 at the corners, and the posts 11 have upper pivots 12 attached to their upper ends, with pivot slides 13 sliding along them. The bodies of the pivot slides 13 are extended above the pivots 12 to limit the upward movement of the pivot slides 13. Scissor links 14 are pinned to one another by link pivots 15, and, at their ends remote from the posts 11, the scissor links 14 are pinned together and to cross-links 16 by inter-link pivots 17.

A centre post 18 is joined to the upper ends of the cross-links 16 by centre pivots 19, and the lower ends of the cross-links 16 are joined by cap pivots 20 to lower cap 21, in the upper side of which a recess 22 is formed, the recess 22 engaging with the lower end of the centre post 18. An extension 24 on the top end of the centre post 18 is provided for a cover to rest on.

Referring now to FIGS. 2, 3 and 4, it will be seen that the shelter apparatus 25 is formed by placing a cover 26 over the frame 10. The cover 26 is attached to the upper portions

of the posts 11, and covers the region above the frame 10 when the frame 10 is in the extended position. The cover 26 rests on the extension 24 on the top of the centre post 18 to produce sloping panels in the cover 26 for water drainage. The cover 26 folds into the scissor links 14 as the frame 10 is contracted.

In use, the shelter apparatus 25 is transported to a desired location in the collapsed position. To extend it into an operative position, it is placed with the posts 11 vertical and the cover 26 uppermost. The posts 11 are lifted and drawn apart, extending the shelter apparatus 25 into its operative position, and the pivot slides 13 slide up along the posts 11 until they abut the upper pivots 12. As a final operation, the recess 22 is engaged with the lower end of the centre post 18.

It will of course be realised that while the above has been given by way of illustrative example of this invention, all such and other modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of this invention as is defined in the appended claims.

THE CLAIMS DEFINED IN THIS INVENTION ARE AS FOLLOWS:-

1. A folding shelter frame assembly of the type including peripheral supporting posts interconnected by scissor linkage assemblies forming respective upper and lower pivot connections to said peripheral posts, the respective upper pivot connections being fixed to the upper ends of the respective posts and the lower pivot connections being slidably fixed to the respective posts, whereby the frame assembly may be moved from a folded configuration with the posts adjacent to one another to an extended configuration with the posts spaced apart, wherein said posts are provided with fixed abutment means adapted to limit upwards travel of the lower pivot connections and maintain the lower pivot connections operatively spaced below said upper pivot connections when the frame assembly is in its extende configuration.

2. A folding shelter frame assembly according to Claim 1, wherein four said posts are arranged about a rectangular plan and interconnected by said scissor linkages each comprising four linkage members, each linkage member being pivotally joined intermediate its length to one other linkage member and each linkage member being further connected at one end thereof to the end of one other linkage member to form upper and lower intermediate pivotal connections, said linkage assemblies including peripheral scissor linkage assemblies disposed between adjacent ones of said posts and defining a periphery of the frame assembly, the outer pairs

of free ends of each said peripheral scissor linkage assembly comprising said upper pivot connection to the upper end portion of their respective posts and said lower slidable pivot connection to their respective posts, and a pair of cross scissor linkage assemblies disposed with their outer pairs of free ends pivotally connected to respective upper and lower intermediate pivotal connections of opposed peripheral linkage assemblies, each of the respective upper and lower pivotal connections of the cross scissor linkage assemblies being combined to form upper sliding and lower fixed central pivot assemblies about a post member extending upwardly beyond said upper sliding central pivot assembly.

3. A folding shelter frame assembly as defined in Claim 2, wherein said lower central pivot assembly is detachably attachable to said central post by pole attachment means including a spigot formed in the upper portion of said central pivot assembly, said spigot being engageable with the lower end portion of said central pole with the frame assembly in said extended position.

4. A folding shelter frame assembly as defined in Claim 1, wherein said scissor linkage assemblies include asymmetric link pairs including links of differing operative length.

5. A folding shelter frame assembly as defined in any one of the preceding claims, wherein said posts include

telescopic portions whereby said posts may be lengthened in the operative position to increase the height of said posts.

6. Shelter apparatus including a frame assembly in accordance with any one of Claims 1 to 5, and including a flexible membrane cover member attached to said frame assembly such that said cover may be stored in a folded position when the frame assembly is in the folded position and may be extended to form a shelter when the frame assembly is in said extended position.

7. Shelter apparatus as defined in Claim 6, wherein there are further provided side covers extendible between said posts.

8. Shelter apparatus as defined in any one of the preceding claims, including anchoring means attached to said frame assembly.

9. Shelter apparatus substantially as hereinbefore described with reference to the accompanying drawings.

DATED THIS Seventh DAY OF April, 1992.

SUMMERCRAFT BLIND & AWNING COMPANY PTY. LTD.
by
PIZZEY AND COMPANY PATENT ATTORNEYS

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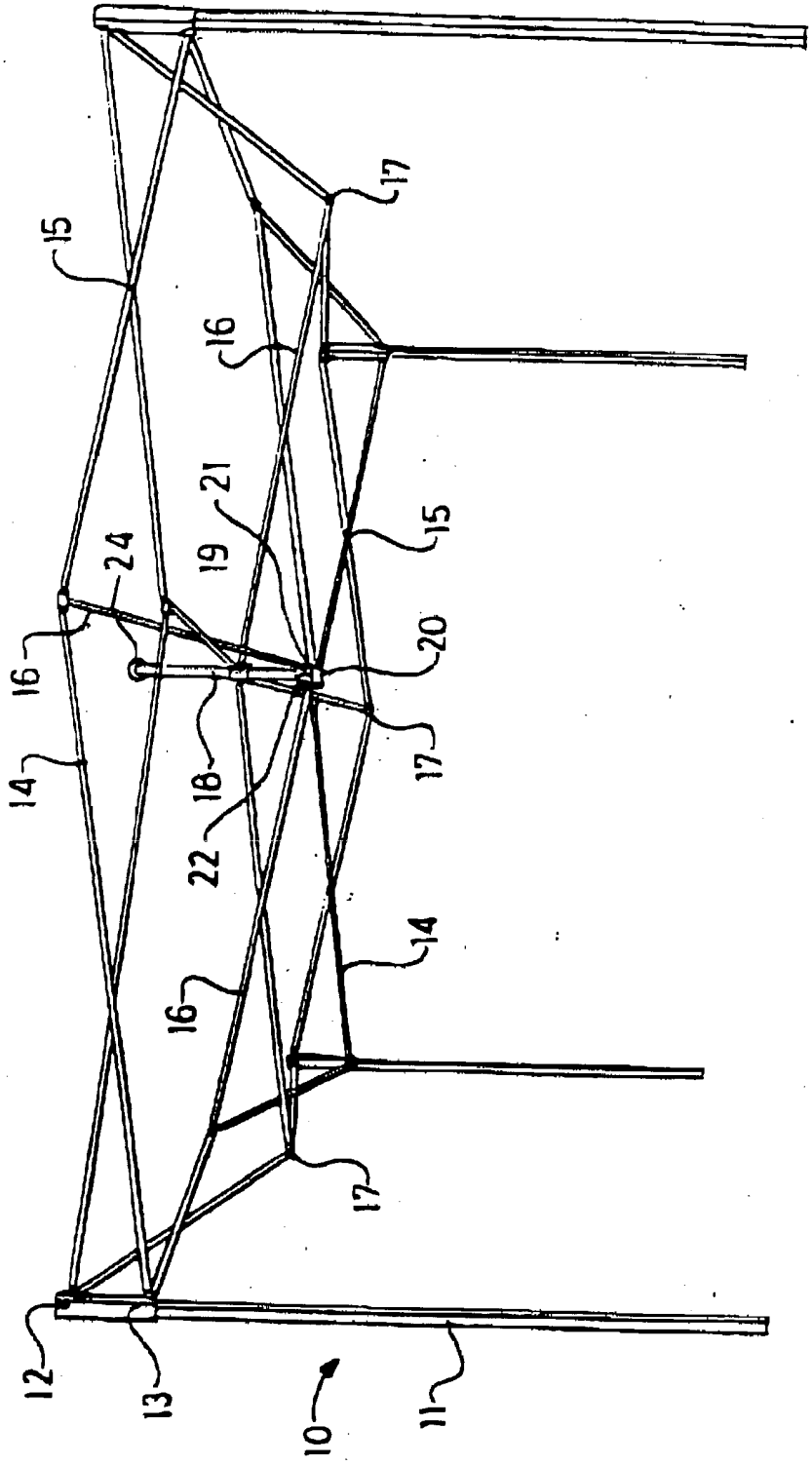

FIG. 1

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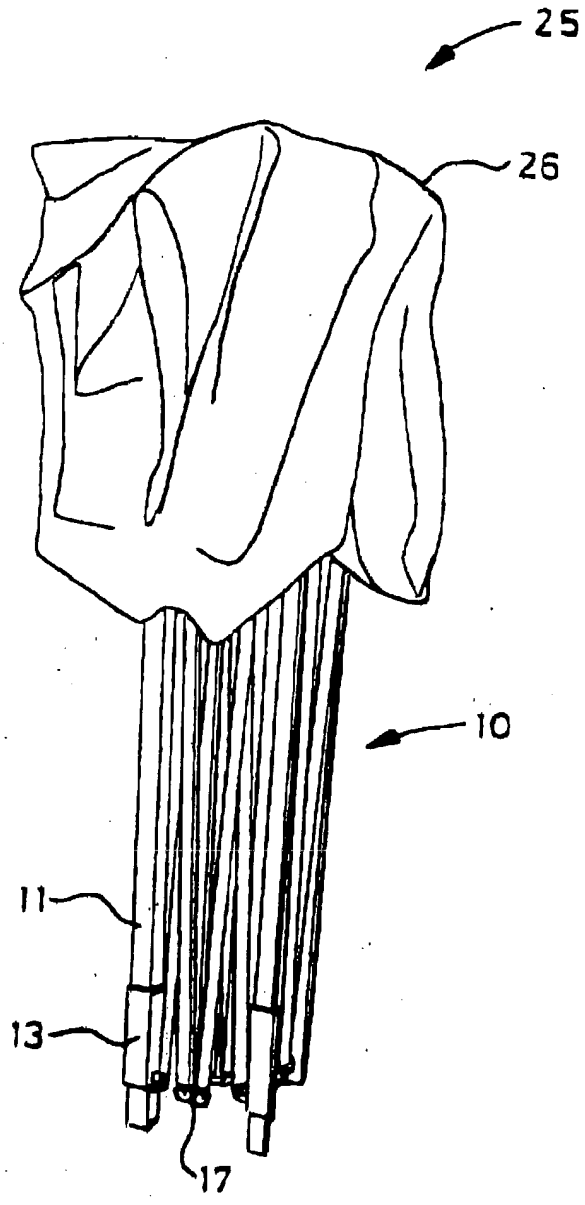

FIG. 2

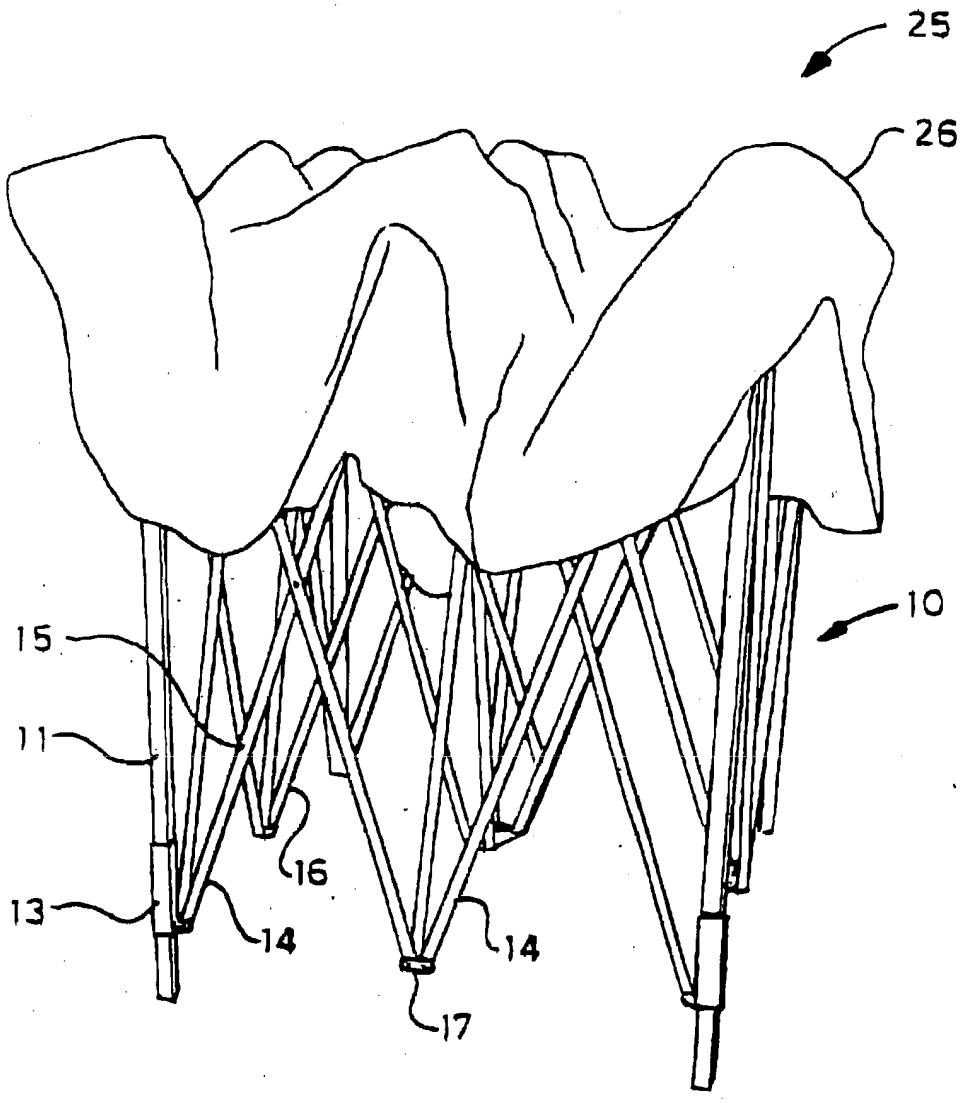

FIG. 3

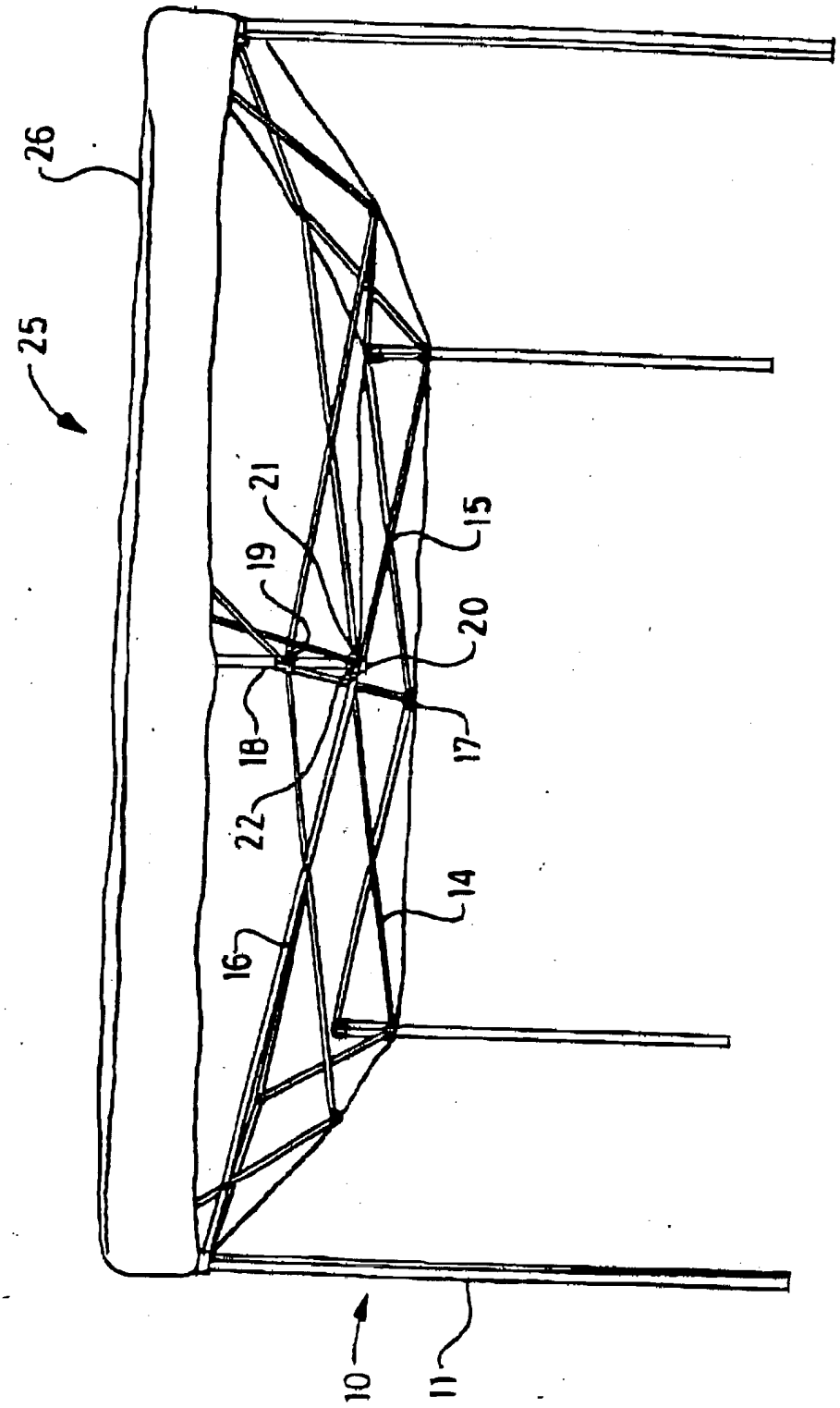

FIG. 4